

Having described the invention, the following is claimed:

1. An apparatus comprising:

a longitudinal member connectable with a bone portion;

a fastener engageable with the bone portion having a longitudinal axis and connecting said longitudinal member to the bone portion;

a housing having a first passage through which said longitudinal member extends, said housing having a second passage with a longitudinal axis extending transverse to said first passage, said fastener extending through an opening in said housing into said second passage and being movable relative to said housing, said longitudinal axis of said fastener being positionable in any one of a plurality of angular positions relative to said longitudinal axis of said second passage;

a spacer received in said second passage of said housing and engageable with said fastener and said longitudinal member;

a member fixedly connected to said housing and extending from said housing into engagement with said spacer to maintain said spacer in frictional engagement with said fastener to prevent relative movement between said fastener and said housing when said longitudinal member is disengaged from said spacer and said spacer engages said fastener, said fastener and said housing being manually movable relative to each other in opposition to said frictional engagement when said longitudinal member is disengaged from said spacer; and

a clamping mechanism that clamps said longitudinal member, said spacer, and said housing to said fastener to prevent movement of said fastener relative to said housing.

2. An apparatus as defined in claim 1 wherein said member is a pin member extending transverse to said longitudinal axis of said second passage.

3. An apparatus as defined in claim 1 wherein said member extends through said housing and into engagement with said spacer.

4. An apparatus as defined in claim 3 wherein said member has a first axial end portion with a first diameter that engages said spacer and a second axial end portion with a second diameter larger than said first diameter that engages said housing.

5. An apparatus as defined in claim 4 wherein said second axial end portion is deformed into engagement with said housing to fixedly connect said member to said housing.

6. An apparatus as defined in claim 3 wherein said spacer has a groove into which said member extends.

7. An apparatus as defined in claim 3 wherein said member has a surface engageable with said spacer that urges said spacer axially toward said fastener and into frictional engagement with said fastener as said member is inserted through said housing.

8. An apparatus as defined in claim 1 wherein said fastener includes a first part spherical surface engageable with a part spherical surface of said housing.

9. An apparatus as defined in claim 8 wherein said fastener includes a second part spherical surface engageable with said spacer.

10. An apparatus as defined in claim 9 wherein said fastener includes a surface engageable with said spacer to limit relative movement between said fastener and said housing.

11. An apparatus as defined in claim 10 wherein said second part spherical surface has a diameter smaller than a diameter of said first part spherical surface, said surface engageable with said spacer to limit relative movement between said fastener and said housing extending between said first and second part spherical surfaces.

12. An apparatus as defined in claim 1 wherein said spacer has an opening through which a tool extends to engage said fastener when said longitudinal member is disengaged from said spacer.

13. An apparatus as defined in claim 1 wherein said clamping mechanism includes a threaded member threadably engageable with said housing.

14. An apparatus as defined in claim 13 wherein said threaded member engages said longitudinal member to clamp said longitudinal member against said spacer.

15. An apparatus as defined in claim 13 wherein said threaded member and said housing have a buttress thread.

16. An apparatus comprising:

a longitudinal member connectable with a bone portion;

a fastener engageable with the bone portion having a longitudinal axis and connecting said longitudinal member to the bone portion;

a housing having a first passage through which said longitudinal member extends, said housing having a second passage with a longitudinal axis extending transverse to said first passage, said fastener extending through an opening in said housing into said second passage and being movable relative to said housing, said longitudinal axis of said fastener being positionable in any one of a plurality of angular positions relative to said longitudinal axis of said second passage;

a spacer received in said second passage of said housing and engageable with said fastener and said longitudinal member;

a pin member fixedly connected to said housing and extending from said housing into engagement with said spacer to retain said spacer and said fastener in said housing when said longitudinal member is disengaged from said spacer; and

a clamping mechanism that clamps said longitudinal member, said spacer, and said housing to said fastener to prevent movement of said fastener relative to said housing.

17. An apparatus as defined in claim 16 wherein said pin member maintains said spacer in frictional engagement with said fastener to prevent relative movement between said fastener and said housing when said longitudinal member is disengaged from said spacer and said spacer engages said fastener, said fastener and said housing being manually movable relative to each other in opposition to said frictional engagement when said longitudinal member is disengaged from said spacer.

18. An apparatus as defined in claim 16 wherein said pin member extends transverse to said longitudinal axis of said second passage.

19. An apparatus as defined in claim 16 wherein said pin member extends through said housing and into engagement with said spacer.

20. An apparatus as defined in claim 19 wherein said pin member has a first axial end portion with a first diameter that engages said spacer and a second axial end portion with a second diameter larger than said first diameter that engages said housing.

21. An apparatus as defined in claim 20 wherein said second axial end portion is deformed into engagement with said housing to fixedly connect said pin member to said housing.

22. An apparatus as defined in claim 19 wherein said spacer has a groove into which said pin member extends.

23. An apparatus as defined claim 16 wherein said fastener includes a first part spherical surface engageable with a part spherical surface of said housing and a second part spherical surface engageable with said spacer.

24. An apparatus as defined in claim 23 wherein said second part spherical surface has a diameter smaller than a diameter of said first part spherical surface, said fastener including a surface engageable with said spacer to limit relative movement between said fastener and said housing extending between said first and second part spherical surfaces.



25. An apparatus as defined in claim 16 wherein said spacer has an opening through which a tool extends to engage said fastener when said longitudinal member is disengaged from said spacer.

26. An apparatus as defined in claim 16 wherein said clamping mechanism includes a threaded member threadably engageable with said housing.

27. An apparatus as defined in claim 26 wherein said threaded member engages said longitudinal member to clamp said longitudinal member against said spacer.

28. An apparatus as defined in claim 26 wherein said threaded member and said housing have a buttress thread.